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EXAMINER	
YAO, SAMCHUAN CUA	
ART UNIT	PAPER NUMBER
1733	

DATE MAILED: 09/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/943,677	COFER ET AL.
	Examiner	Art Unit
	Sam Chuan C. Yao	1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 98/06551 in view of Bonazza (US 5,089,326), (Kosuga et al (US 4,960,642) or Mayama et al (US 4,530,779)).

With respect to claim 1, WO '551 discloses a process of making a sheathed impregnated fiber strand in a form of heat-moldable pellet, the process comprises: impregnating synthetic reinforcing fibers such as carbon or graphite fibers with an organic wetting agent in a pan to *"coat substantially all"* reinforcing fibers using a conventional applicator or *"any other construction suitable for applying the desired type and amount of chemical treatment"* (abstract; page 6 lines 1-14; page 8 lines 5-32; page 9 lines 11-25; page 12 lines 11-16; page 14 lines 14-23; page 24 lines 10-28), wherein the amount of wetting agent applied is preferably around 5-15% by weight (page 16 lines 19-30); forming the impregnated reinforcing fibers into a preimpregnated bundle or strand (page 16 lines 13-32); and, encasing the preimpregnated strand with a thermoplastic material to form the sheathed impregnated fiber strand (page 60; claim 1). WO

'551 does not teach coating carbon fibers with a metallic material. However, it would have been obvious in the art to coat the carbon fibers taught by WO '551 with a metallic material in making a sheath impregnated fiber strand (i.e. heat-moldable pellet), because: a) WO '551 is open to using virtually any known reinforcing fibers as evidence from the following passage, *"... and other non-glass materials having suitable reinforcing characteristics"* (page 14 lines 19-22; page 47 lines 27-28); b) Bonazza teaches using metal coated carbon fibers in making a fiber-reinforced composite, the composite has increase conductivity over a normal carbon fiber reinforced composite, thereby making it ideal for EMI shielding application, and also *"provides good mechanical properties and convenient processability"* (abstract; col. 3 lines 16-30; col. 5 lines 11-33, lines 63-68; col. 6 line 65 to col. 7 line 5); and, it is old in the art to form heat-moldable pellets from metal-coated glass or carbon (i.e. reinforcing) fibers for use in making an EMI shielding material as exemplified in the teachings of Kosuga et al (col. 1 line 8 to col. 2 line 31) or Mayama et al (abstract; col. 2 lines 27-41). With respect to claims 27-28, it is a notoriously common practice in the art to metallically coat carbon fibers by feeding carbon fibers to a metal electroplating operation.

3. Claims 1-24 and 29-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 98/06551 in view of Bonazza (US 5,089,326), (Kosuga et al (US 4,960,642) **and/or** Mayama et al (US 4,530,779)), one of (Devanathan (US 4,978,360)

and Rau et al (US 4,752,513) and optionally further in view of Philipps et al (US 5,866,253).

With respect to claim 1, WO '551 discloses a process of making a sheathed impregnated fiber strand in a form of heat-moldable pellet, the process comprises:

impregnating synthetic reinforcing fibers such as carbon or graphite fibers with an organic wetting agent in a pan to *"coat substantially all"* reinforcing fibers (abstract; page 6 lines 1-14; page 8 lines 5-32; page 9 lines 11-25; page 14 lines 14-23; page 24 lines 10-28), wherein the amount of wetting agent applied is preferably around 5-15% by weight (page 16 lines 19-30) and heat is applied to reduce the viscosity of the wetting agent (abstract); forming the impregnated reinforcing fibers into a preimpregnated bundle or strand (page 16 lines 13-32); encasing the preimpregnated strand with a thermoplastic material to form the sheathed impregnated fiber strand (page 60; claim 1). WO '551 does not teach coating carbon fibers with a metallic material. However, it would have been obvious in the art to coat the carbon fibers taught by WO '551 with a metallic material in making a sheath impregnated fiber strand (i.e. heat-moldable pellet), because: a) WO '551 is open to using virtually any known reinforcing fibers as evidence from the following passage, *"... and other non-glass materials having suitable reinforcing characteristics"* (page 14 lines 19-22; page 47 lines 27-28); b) Bonazza teaches using metal coated carbon fibers in making a fiber-reinforced composite, the composite has increase conductivity over a normal carbon fiber

reinforced composite, thereby making it ideal for EMI shielding application, and also *"provides good mechanical properties and convenient processability"* (abstract; col. 3 lines 16-30; col. 5 lines 11-33, lines 63-68; col. 6 line 65 to col. 7 line 5); and, it is old in the art to form heat-moldable pellets from metal-coated glass or carbon (i.e. reinforcing) fibers for use in making an EMI shielding material as exemplified in the teachings of Kosuga et al (col. 1 line 8 to col. 2 line 31) or Mayama et al (abstract; col. 2 lines 27-41).

WO '551 does not teach feeding conductive fibers into a bath of wetting agent to impregnate the conductive fibers. However, it would have been obvious in the art to impregnate electrically conductive reinforcing fibers with an organic wetting agent, by feeding them into a bath of the organic wetting agent, because it is a well known and conventional in the art to feed reinforcing fibers into an organic resin bath in order to effectively impregnate the reinforcing fibers such as carbon fibers with the organic resin as exemplified in the teachings of Devanathan (col. 2 lines 3-14; figure 1) or Rau et al (col. 6 lines 50-53; example 2; figure 1). Optionally, Philipps et al is cited as further evidence that it is known to art to interchangeably use an applicator or a bath to impregnate spread filaments from a strand with a sizing agent or binder solution (col. 4 line 24 to col. 6 line 16; figures 3-5).

With respect to claim 2, see page 6 lines 13-14 and claim 2 of the WO '551 patent.

With respect to claim 3, see claim 17 of the WO '551. In light of the similarity of the production processes, the molded pellet in the process of WO '551 must naturally form a composite having an electromagnetic shielding characteristics, and the organic wetting agent also must naturally enable an even distribution of the fibers in the composite.

With respect to claims 4-5, it is a notoriously common practice in the art to metallically coat carbon fibers by feeding carbon fibers to a metal electroplating operation.

With respect to claims 6 and 8, see figure 1 of the Devanathan patent.

With respect to claim 7, one in the art would have applied a workable processing speed to ensure that fibers are effectively impregnated with an organic wetting agent.

With respect to claims 9-11 and 13, see page 17 lines 19-24; page 18 lines 5-19; and page 24 lines 10-28 of the WO '551 patent and figure 1 of the Devanathan patent.

With respect to claim 12, see page 52 lines 13-18 of the WO '551 patent.

With respect to claims 14, 16 and 18, in order to enhance production efficient, the limitation in this claim would have been obvious in the art. See figure 4 of the WO '551 patent.

With respect to claim 15, see page 31 lines 31-32 and claim 3 of the WO '551 patent.

With respect to claim 17, one in the art would have determined, by routine experimentation, suitable pellet size for the desired end-use of the process.

With respect to claims 19-20, see page 6 lines 21-30 of the WO '551 patent.

With respect to claims 21-24, since: a) WO '551 teaches impregnating fibers with a film forming organic matrix in forming pellets (page 9 lines 11-25); b) a wax is a well known film forming organic matrix in the art; and, c) Kosuga et al, drawn to a process of making pellets, teaches impregnating a electrically conductive fibers with a wax to enhance a wettability of conductive fibers so that the fibers can be dispersed uniformly in a matrix resin (col. 3 lines 6-32; claims 1-2), it would have been obvious in the art to impregnate conductive reinforcing fibers in the process taught by WO '551. As for the wax emulsion bath composition, it is conventional in the art to use a wax emulsion bath for impregnating fibers and the recited composition is taken to be old in the art. Moreover, the recited composition is taken to be a result effective variable, routinely optimized by those versed in the art. As for the desired amount of wax coating on the fibers, see claim 1 of the Kosuga et al patent and page 6 lines 21-30 of the WO '551 patent. As for claims 22-24, see claim 3 of the Kosuga et al patent. Moreover, the recited thermoplastic sheathing materials and recited pre-heating step are taken to be conventional in the art.

With respect claims 29-35, see page 10 lines 7-8 and claim 66 of the WO '551 patent.

4. Claims 1-9, 11-20 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mayama et al (US 4,530,779) in view of WO 98/06551.

Mayama et al, drawn to making a thermo-moldable pellet, substantially discloses the process recited in claim 1. Mayama et al differs from claim 1 in that, Mayama et al is silent on the amount of wetting agent (i.e. coupling agent). However, since WO '551, drawn to a process of making a thermo-moldable pellet of a type similar to the pellet taught by Mayama et al, teaches preferably coating about 5-15% by weight of a chemical treatment such as a coupling agent to reinforcing fibers (page 7 lines 25-32; col. 16 lines 27-30); and, since one in the art would have been determined, by routine experimentation, a workable composition in order to obtain the desired processing characteristics, this claim would have been obvious in the art.

With respect to claims 2-9, 11-20, for essentially the same reasons set forth in numbered paragraphs 2-3 above, these claims would have been obvious in the art.

With respect to claim 25, Mayama et al differs from this claim, in that, Mayama et al does not appear to substantially coat all of metal coated carbon fibers. However, such would have been obvious in the art, because WO '551 teaches the importance of substantially coating a fiber strand to obviate problems encountered of only coating an outer portion of a fiber strand (i.e. *"leaving a central core fibers not impregnated with the thermoplastic"*) in forming a pellet (page 4 line 26 to page 25 line 21).

With respect to claim 26-27, these claims would have been obvious in the art for the same reasons set forth in numbered paragraph 2.

Response to Arguments

5. Applicant's arguments filed on 12-03-03 have been fully considered but they are not persuasive.

On page 5 1st and 2nd full paragraphs, Counsel argues that, each of independent claims 1, 21, and 25 requires feeding metal coated carbon fibers into a bath containing an organic wetting agent , while *"[t]the WO '551 reference, in contrast, is directed to a method wherein a chemical treatment is applied to fibers by means of an applicator 26 consisting of a roller and a pan ..."*; accordingly, Examiner has proposed to modify WO '551 in view of either Mayama or Devanathan. At the outset, it should be emphasized that, independent claim 25 as presently recited does not require feeding metal coated carbon fibers into a bath. Moreover, while it is true that, WO '551 teaches using an applicator, WO '551 also teaches that *"The applicator can be of a conventional or any other construction suitable for applying the desired type and amount of chemical treatment."*. (page 12 2nd full paragraph). This passage clearly suggests that, WO '551 is NOT restrictive to using a roller and pan applicator, but is open to using other types of applicator/coater. In addition, in view that, dipping filaments in a strand to a solution/resin bath to impregnate substantially all the filaments is a notoriously well known effective technique in the art, such would have been

obvious in the art wanting to substantially coat all filaments in a strand in the process taught by WO '551.

On page 5 3rd full paragraph, Counsel argues that *"there is no teaching in Mayama that the titanate coupling agent is capable of penetrating the bundle to coat substantially all of the individual fibers thereof as required by WO '551"*. First of all, Counsel argument is moot in light of the new ground of rejection. Equally important, one in the art motivated by the desire to coat substantially all of the individual fibers in a bundle in a bath would have simply perform one or a combination of following processes:

a) reduce the viscosity of a treatment solution by subjecting to a heater as suggested by WO 551 (abstract);

b) feed "loosely gathered core" into a heated bath so that "hot polymer is impregnated into the loosely gathered core" as suggested by Devanathan (col. 2 lines 3-14);

c) spread filaments in a strand apart before dipping the filaments into a bath to *"wet out the filaments"* as suggested by Philipps et al (col. 4 line 1 to col. 6 line 8).

As for Counsel's argument on page 5 last three lines to page 6 line 5 regarding Devanathan, Examiner strongly disagrees with Counsel's assertion that *"one of ordinary skill in the art would not have looked to Devanathan as an answer to the problem of ensuring that all of the fibers in the bundle are impregnated with a sizing."*. The process taught by Devanathan would have suggested to one in the

art that, a loosely gathered strands of filaments can be coated substantially by dipping them in a bath of wetting agent. Moreover, as repeatedly noted earlier, it is a notoriously common practice in the art to substantially impregnate filaments in a strand by subjecting the strand to a bath of resin as exemplified in the teachings of Rau et al (example 2; figure 1) or Philipps et al (col. 5 line 1 to col. 6 line 16; figures 4-5).

As for Counsel's argument on page 6 regarding the Bonazza patent, Counsel is referred to Examiner's response in prior office action. Equally important, as noted above, it is old in the art to form heat-moldable pellets from metal-coated glass or carbon (i.e. reinforcing) fibers for use in making an EMI shielding material as exemplified in the teachings of Kosuga et al (col. 1 line 8 to col. 2 line 31) or Mayama et al (abstract; col. 2 lines 27-41).

Conclusion

IN LIGHT OF A NEW GROUND OF REJECTION, THE PROSECUTION OF THIS APPLICATION IS REOPENED AND THIS ACTION IS MADE NON-FINAL.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Chuan C. Yao whose telephone number is (571) 272-1224. The examiner can normally be reached on Monday-Friday with second Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571) 272-1156. The fax phone

number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sam Chuan C. Yao
Primary Examiner
Art Unit 1733

Scy
09-16-04